

# Ac booster magnet measurements with an indexed rotating coil

- Alternate technique to SSW
- Integrate signal at fixed angle from  $t_1$  to  $t_2$ 
  - Index by fixed angle, repeat
  - Fourier analyze results
    - Extract  $b_n(t_2)-b_n(t_1)$ ,  $a_n(t_2)-a_n(t_1)$
    - $t_1$ ,  $t_2$  correspond to  $I_1$ ,  $I_2$
    - If  $b_n(t_1)$ ,  $a_n(t_1)=0$ , this gives the usual results, instead get the **change** in multipole coefficients up the ramp

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- Details
  - Support suitable rotating coil (radius, length) using fixtures similar to those we use for the mole
  - Don't attempt to reach entire body
    - Cover 2 positions: end, body near end
      - Bring shaft outside
      - Limited coverage limits flex in shaft
      - cover enough to get clean, all body measurement
  - No aperture scan, center only

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- more details
  - Record analog bucked tan winding or summed (series connected) Morgan coil windings (analog bucking for free)
    - Use DVMs with external triggering and script to record winding voltage and magnet current
      - Synchronize first external trigger to cycle current and record “n” triggers up the ramp
      - cycle current synchronization imperative

# Ac booster magnet measurements with an indexed rotating coil

- Is measuring the change in multipole coefficients useful?
- Remark: a “standard” technique for measuring AC
  - not so difficult or expensive but
  - Used in MTF rarely, limited success
  - used elsewhere